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Color and the Grid

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ROCHESTER INSTITUTE OF TECHNOLOGY

A Thesis Submitted to the Faculty of
The College of Fine and Applied Arts
In Candidacy for the Degree of
MASTER OF FINE ARTS

COLOR AND THE GRID

By

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ACKNOWLEDGMENTS

I dedicate this thesis to my wife, for without her none of this would have been possible.

I would like to express my appreciation to my advisors, Donald Bujnowski, Max Lenderman and Phillip Bornarth, for their continued guidance and patient understanding throughout the writing of this thesis. I am indebted to all those friends who gave of their time and offered words of encouragement.

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGMENTS	iii
PROPOSAL	vi
LIST OF PLATES	vii
INTRODUCTION	viii
CHAPTER I. METHODS	1
A. Tapestry	1
B. French Dyes	2
C. Netting	6
D. Dyeing	6
E. Egg Tempera	8
CHAPTER II. THE WORKS	10
A. Feathered Cape	10
B. Convex Color	13
C. Homage to E. K.	16
D. C.S.C.R.	19
E. Colored Courts	22
F. The Flapper	26

CONCLUSIONS	28
LIST OF REFERENCES	29

PROPOSAL

In my thesis I would like to interpret visually my reactions and impressions of natural and man-made grid systems. Examples of grid systems that have impressed me include such things as spider webs, stone foundations, barn siding, fish nets, barred windows, the colored squares of Ellsworth Kelly and Paul Klee, and the block patterns of an overshot coverlet.

I intend to accomplish this from two directions. The first will consist of a series of traditional tapestries designed and woven to express my reactions to flat and colored grid systems in my environment.

The second series of pieces will consist of painted silk and Plexiglass constructions that will express the multiple dimensionality of the grid.

LIST OF PLATES

PLATES	PAGE
1. FEATHERED CAPE	12
2. CONVEX COLORS	15
3. HOMAGE TO E. K.	18
4. C.S.C.R.	21
5. COLORED COURTS	
(a).	23
(b).	24
(c).	25
6. THE FLAPPER	27

INTRODUCTION

My thesis is about color and design originating from a simple checkerboard or tennis court grid. Although grid forms exist throughout nature I became attracted to grids specifically from an appreciation of man-made nets and the "Magic Squares" of Paul Klee. I saw in the grid a means to study color relationships.

In my thesis are six works which were experiments in color relationships. These works were done using various fiber techniques rather than other forms of art because of the personal attraction to the tactile qualities of fiber and the process of weaving.

In the thesis specific techniques will be discussed, and a description of each work will be presented.

CHAPTER I. METHODS

A. Tapestry

A tapestry is a weft-face plain weave fabric in which pattern areas are built up by free weaving techniques. The design is often pictorial. There are many traditional styles of tapestry weaving, each deriving its name from a region or group in which it originated. Modern tapestry weavers borrow methods and ideas from many sources, both contemporary and historical, in order to achieve their expressive purposes. Specifically, Navajo weaving (Ref. 1, 2), both by their weaving process and for their designs, has strongly influenced me.

Traditionally, a singles wool yarn was used for weft since wool is soft and packs readily around the warp. For my tapestries, I selected, however, silk material cut into fine strips because of its sheen and ability to dye easily, a large wool roving for its size, and a cotton cord for its challenging texture and color series which was available commercially.

B. French Dyes

The "French" dyes, as they have come to be known, are synthetic basic dyes in liquid form (Ref. 3). They are primarily used for direct painting on silk, wool, and cotton, with a rubber cement-like resist called gutta-serti (Ref. 4). They can also be silk-screened and air brushed. Having been introduced into the United States in 1977, the French dyes and their application is relatively new in the U.S., with very little published on how to use them. For this reason, experimentation was required to develop a technique that gave reproducible results. The French dyes were originally selected, however, because of their extraordinary brilliance and wide range of colors.

The dyes were introduced into France in the 1920's by unidentified immigrants who made their living hand painting silk and wool fabric. There are two French companies, H. Dupont, 86 Rue Clery, 7500 Paris, France, and Sennelier Tinfix, 6806 Trexler Road, Lanham, MD 20802, which produce and have available two forms of basic dye, one for silk and wool and another for cotton. The shelf life of the liquid dyes is about two years. This year an American firm, Cerulean Blue Ltd., P.O. Box 5126 SD, Seattle, WA 98105, makes and sells these dyes in a dry form, which they advertised to be more stable.

The procedure for painting silk wool or cotton with French dyes is as follows: Silk fabric should first be washed by boiling it with a few drops of ammonia and detergent to remove any natural gum. Cotton and wool should be washed in a mild detergent to remove any sizing. When dry, attach the fabric at the selvages to a stretcher frame or tape to the working surface without distorting the shape of the material. Push narrow leash sticks under the fabric at the selvages and turn on edge to lift the material off the table. The leash sticks can be moved about protecting freshly painted sections of the design, as dark water marks occur when wet areas touch the working surface.

The gutta resist has a rubber base and usually comes ready to use. However, it may be too thin and run, or too thick and not penetrate the fabric. It should be tested before each use. The thick gutta can be thinned with gutta-solvent, and the thin gutta thickened by evaporation. The method used to apply gutta depends on the width of the line needed. Wide lines are made with a plastic squeeze bottle and nozzle supplied by the dye companies. Medium lines can be achieved with a paper cone made of heavy tracing paper or vellum. Fine lines are made with a blunt needle and syringe. Each area of the design must be carefully

outlined because the dyes spread rapidly and will seep through the smallest fault in the gutta. The design can be transferred directly on slightly elevated fabric by tracing over the cartoon with gutta. When the gutta is dry, approximately one half hour, the fabric is ready to paint.

These dyes come ready to use; undiluted, they give the most intense color. Tints with the silk and wool dyes are produced by mixing the dyes with a solution of equal parts of water and rubbing alcohol. The cotton dyes should be diluted with water alone. Large areas are difficult to paint evenly with pale colors because the components of the dye tend to separate. Each dye can be mixed with all the other dyes to give an infinite number of colors; however, they should not be mixed on the fabric if an even color is desired. When large areas are to be painted, sufficient dye is mixed in advance to cover the area at one time. A round, natural hair, size #10 water-color brush gives good painting results. These dyes spread very rapidly; therefore, it is not necessary to paint close to the resist line. If dye goes over the resist, it will stain the fabric beneath, even after the gutta is removed. When changing colors, wash the brushes in detergent and rinse in clear water.

When dry, the surface of a freshly painted fabric is vulnerable to water damage. Considerable care should be exercised when handling an unfixed painted fabric. Do not fold the fabric over on itself, but carefully roll it in brown paper for storage or steaming. For steaming (Ref. 5), fold the rolled fabric into the shape of a wreath and tape or staple the ends together. Steam for one hour. Then dry clean to remove the gutta. Once fixed, fabrics painted with French dyes are very stable and can be either dry cleaned or hand washed.

The following technique was developed to make hard edged drawings on silk with the French dyes. This method can also be used to fill in the white outlines left by the gutta. Attach the fabric to a frame at the selvages, taking care not to distort its shape. Coat the entire surface of the fabric with hot batik wax. When cool, lay the waxed fabric over the cartoon and trace the lines with a small tailor's wheel or a pizza cutter. Press hard enough to cut through the wax, but not hard enough to cut the silk. Lift the fabric off the cartoon and carefully fill in the lines with dye using a fine brush. Spots of dye can be blotted off the waxed fabric while wet. When the dye is dry, de-wax the fabric, roll it in paper, steam it for one hour, and then dry clean it to remove the wax. This method and the gutta method can be combined in any order.

Painted or open areas covered with wax are not as vulnerable to damage as unwaxed areas.

C. Netting

A net (Ref. 6), is an open-work fabric constructed from a single, continuous strand of fiber knotted repeatedly over a gauge. In certain variations of the netting technique, the yarn is merely layered upon itself, a process known as knotless netting (Ref. 7). The knotted version, however, is more important. Netting produces an open-work fabric usually rectangular in shape with either square or diamond shaped openings.

My interest in the grid began with my introduction to nets and the simple process of knotting. I visualized that the square grid of the net could be an outline for a design, or act as a supporting ground for elements tied on or laced through the open meshes. These experiments helped to formulate the idea for the Plexiglass constructions.

D. Dyeing

The dyeing process (Ref. 8), takes advantage of the fact that most organic fibrous materials are capable of

absorbing water. When dyes, dispersed in a molecular state in water, are brought into contact with a fiber such as wool or silk, the coloring matter leaves the water and becomes attached to the fiber. The dye process has been accomplished when the dyebath has been exhausted and the fibers have assumed the color of the dye. As a general rule, other compounds, termed assistants, are used in the dyebath in order to produce a fast and evenly colored fiber. In some cases this can take place only in the presence of certain metal ions derived from chemical salts. The latter process is called mordanting.

My experimentation with dyes was quite extensive because I needed very specific colors for my tapestries. I worked specifically with acid dyes in powder form and tried various single and multiple combinations of dyes. In most cases, the desired colors could be achieved by mixing dyes in a single dye bath; however, to arrive at the desired green, it was necessary to dye first with blue and then over-dye with yellow. This is the reverse of what is commonly suggested. Test colors were initially done with five gram swatches. It was found that colors in the sampler could be readily duplicated in production batches.

In my experiments with dyeing, I also found that the most even results were achieved when the silk

material or wool yarns were boiled with the glauber salts before the dye was added.

The process of dyeing for me is a direct link to colors in their simplest form. I derive a great deal of satisfaction in manipulating the colors and other chemicals to obtain a desired color. Learning this process has also freed me from dependence upon commercially available colors and has instilled a real sense of control over my art expression.

E. Egg Tempera

The term "tempera" (Ref. 9), has been loosely applied to almost all kinds of paints other than oils and watercolors. Tempera refers only to a pigment bound by an emulsion, and egg tempera refers specifically to the paint formed by pigments suspended in egg yolk alone.

In egg tempera, the colors cannot be blended and manipulated in the same way oil paints are, because egg tempera dries too quickly. Color transitions must be carried out by linear rather than broad pictorial means, especially by hatching and cross-hatching using small, round, sable brushes. These restrictions are similar to those in tapestry weaving and are not unlike laying one yarn at a time into an open shed to build up

an area of color. I find an unexplained freedom with the demanding limitation of both egg tempera painting and tapestry weaving. Both are good for rendering well defined and clearly formulated graphic conceptions.

The idea of starting work with a graphic concept in mind combined with the intensity of the color is what attracted me to egg tempera painting. In preparation for my thesis, I did a number of egg tempera paintings on 6 inch x 9 inch gessoed boards in which color was painted on in checkerboard patterns. Some incorporated gold leaf into the design. From this, I gained experience in scaling colors slowly and deliberately and began to gain a feeling of control of color that carried over into my fiber designs.

CHAPTER II. THE WORKS

A. Feathered Cape (Plate 1)

This was the first of the Plexiglass constructions. The design is a visual response to seeing a feathered ceremonial cape from a primitive South American tribe. The cape had a rectangular block design in brilliant gold and blue feathers. I selected the French dyes for painting on silk because of their color potentials, which combines with the luster of the silk, and used rya knots to imitate the feathered appearance.

Two layers were used to increase the perception of depth. The inner layer was French dyed silk, the outer layer consisted of a metallic net, the mesh of which was filled in with silk yarn tied in rya knots. The colors of the panels of the outer and inner layers were reversed so that flecks of the opposite color could be seen through the net, increasing the depth. The original idea for the net was to provide a grid pattern superimposed over the colored panels; however, the rya knots tied to the net, and used to produce the feather-like texture, hid that effect.

The white plastic frame was selected so that it blends with, and appears to be continuous with, the white silk ground. However, because of the thickness of the frame it was heavier than desired and tends to crowd the elements of the design.

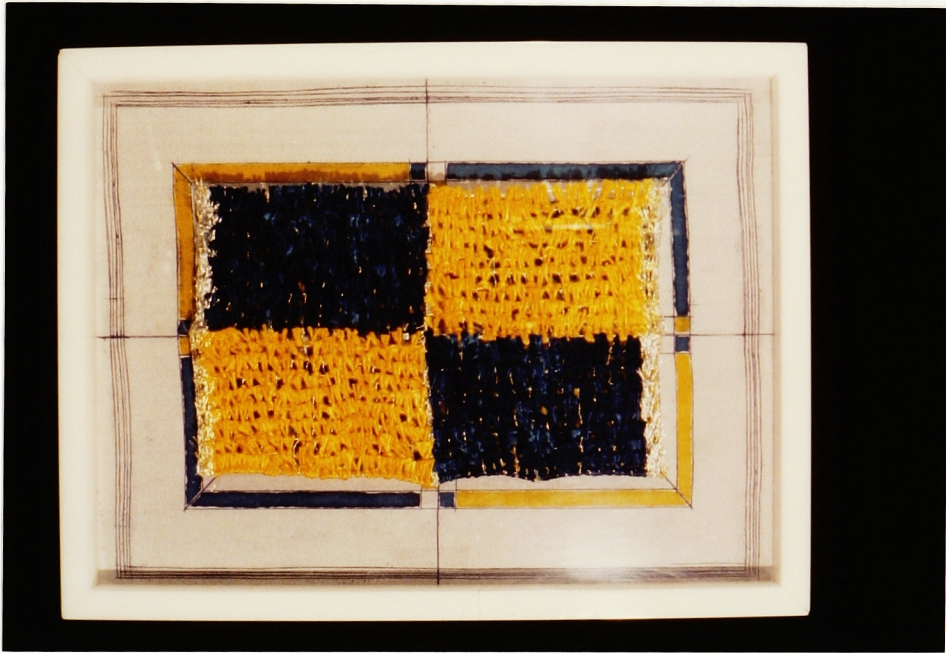


PLATE 1

B. Convex Color (Plate 2)

The inspiration for this tapestry came from a painting by Ellsworth Kelly, Thirteen Panels: Spectrum II (Ref. 10), and from Johannes Itten's Twelve Hue Circle (Ref. 11). While studying the works of these two painters and those of Paul Klee's, I became interested in the visual effects of colored scales and cycles using multiple hues.

This tapestry consists of three separate but integrated visual layers. The outermost layer dominates the tapestry with its intensely colored verticle stripes. Each of the colored stripes is separated by a gray stripe made of at least two and sometimes three shades of gray, alternating vertically, dark, light, dark. By varying the length of the dark and the light gray stripes, three convex geometric figures were produced and appear in the deepest layer. Also, the larger bottom figure was darkened from the center outward to give it additional volume. The area between these two layers was filled with the light gray concave outline of the three rounded figures. In addition to the over-all effect of either color or figures, the quality of color in each of the colored stripes is altered throughout its length by the shade of gray next to it. Therefore, each colored stripe may appear

to be woven of several shades of that color. The gray is altered by the phenomenon of simultaneous contrast.

The original intent was to weave the tapestry in large rug yarn. Then the suggestion was made, and ultimately adopted, to weave with silk material dyed to scale and cut into narrow strips. The close-up results having woven the tapestry with silk were three-fold. First, the colors are brighter on the silk because of its natural luster. Second, a very fine soft texture was produced by the unraveled silk strips and by leaving short pieces or tags protruding from the web. These small tags of silk interrupt the otherwise soft texture of the tapestry and help to identify the material used to weave it. Third, the overall hand to the tapestry is one of quiet luxury. The entire tapestry was woven with the silk strips except the light gray concave ground which was done in a luminous silk cord. The cord was selected to give the ground figure a slight but perceptible change in texture. The presence of the warp can be perceived under the cord in the ground area and adds a fine horizontal line to the design.



PLATE 2

C. Homage to E. K. (Plate 3)

The size of this tapestry and the color selection was influenced by Ellsworth Kelly's large monochromatic panel painting called "Four Panels: Green Red Yellow Blue" (Ref. 12). Kelly used the four visible primaries (Ref. 13), but I added a fifth color, violet to act as a pivot in the cycle.

The colors in "Homage to E. K." were arranged to produce a natural flow to the colors in this cycle. Each of the five panels, beginning from left to right, is divided in half vertically. The left half of each panel represents a whole step in the color cycle and is a mixture of a primary color and a tint of that primary. The right half of each panel represents a half step in the cycle and is a mixture of a tint of the primary color on the left half and the primary of the next panel. The colors are arranged similarly in the remaining four panels. A strong diagonal line is produced by alternating contrasting colored yarns in a 3/3 twill weave. The mixture of colors produces an interesting pointilistic textural effect to the surface of the tapestry. A strong vertical line is created at the intersection of the diagonals and the point where colors are changed. The vertical and diagonal lines are strengthened and given volume

by the triangular frames. In a front view, the eye moves horizontally through the color cycles, diagonally along the contrasting colors, and vertically up or down at the point of color change. Viewed from the extreme left, however, only the primary colors are visible and from the right, only the mixed panels are visible.

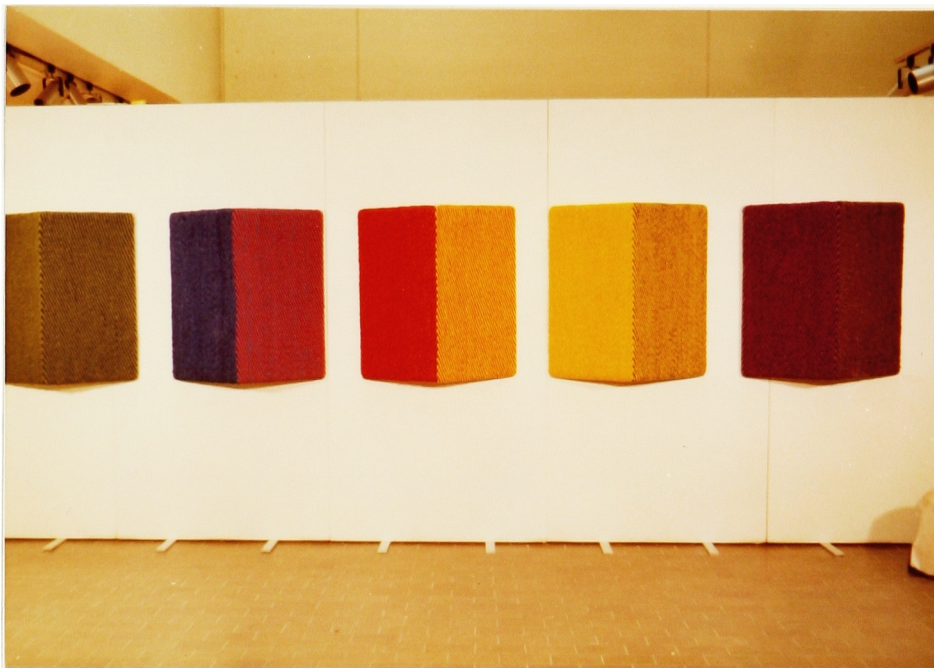


PLATE 3

D. C.S.C.R. (Plate 4)

Having done a number of pieces in colors close to their primary intensity this tapestry was to demonstrate an ability to work with subtle, closely related colors. A secondary purpose was to weave successfully with a 100% 20-ply cotton yarn called Creole. It had a soft hand and subtle colors that were easy to scale from dark to light. In loosely woven garments and rugs this yarn is bulky and dominating, but in the fabric produced by tapestry weave, the apparent bulk of the yarn is reduced, and allows the soft hand and colors to emerge.

The idea for the design came from a picture of a sleeveless checkerboard shirt (Ref. 14), woven in Peru in the 15th century. The design of the shirt included a large terraced diamond surrounding the neck slit. Subsequently, I followed three integrating guidelines. First, the hard edge line of the checkerboard was to be maintained throughout. Second, a unifying color was to be selected and not altered. Third, the central diamond was to be woven in a mixture of textures and fibers which included cotton, silk, cotton chenille, and raffia.

The design was satisfactory in all but the central white diamond. The texture of the various white yarns

were not forceful enough to carry the checkerboard pattern. The problem was resolved by sewing a fine gray line around each white square in the diamond to emphasize the pattern. The color and hard surface of the raffia were used to break up the consistent soft texture of the cotton yarns, and to refine the points and sides of the diamond.

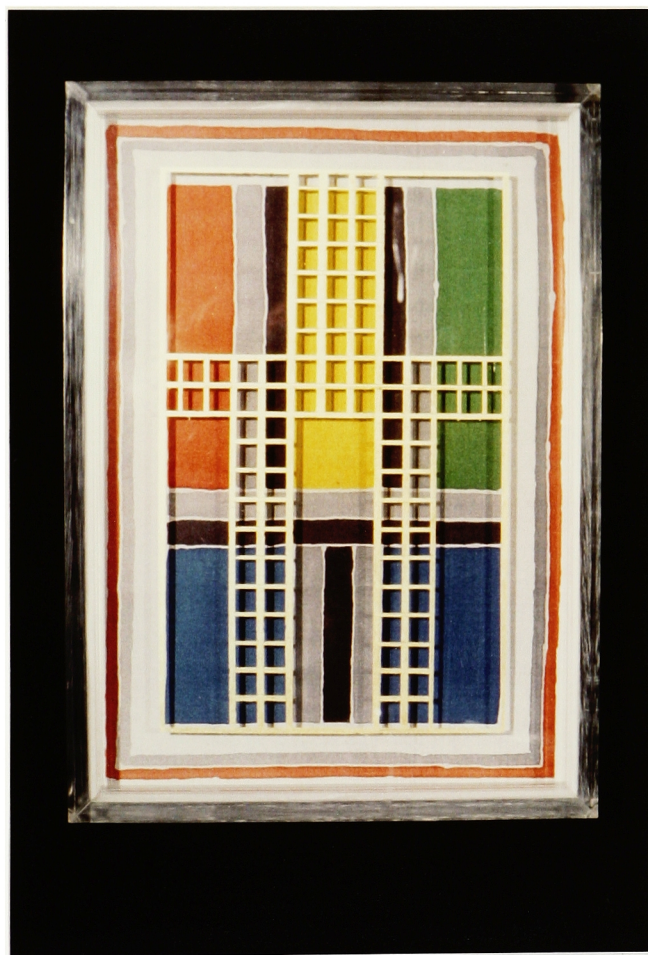


PLATE 4

E. Colored Courts (Plate 5)

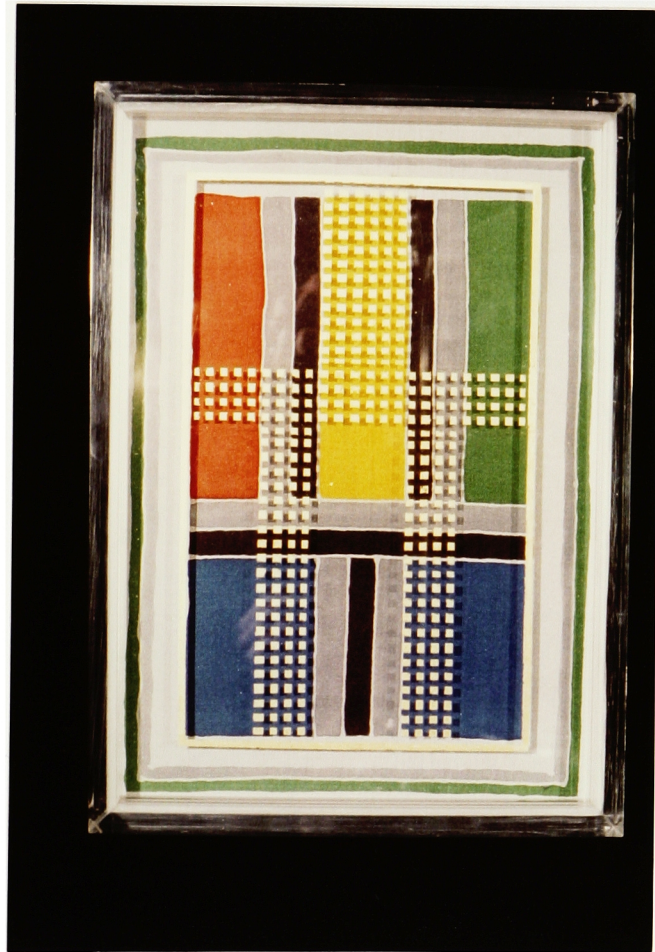
The "Colored Courts" is a series of Plexiglass constructions in which I attempted to achieve a balance of colors in a grid pattern. The underlying layer was to be a silk panel painted with French dyes. The design for the silk panel was initially determined, and on this pattern the visible primary colors: red, blue, yellow, and green, were painted according to a judgment of their weight relationships. Yellow was considered to be the lightest in weight and was located in the center. The yellow is balanced with the lateral red and green by the increased size of the yellow panel and the two black stripes. The increased proportion of the two blue panels below supports and are in balance with the colors and the black and gray stripes.

From the very beginning the silk panel was to be a backdrop for an overlying checkered grid. The grid was to echo some elements of the painted silk panel. The figure produced by the black and gray lines was selected as the limits for the grid. The first one was done in gold leaf and the results were so satisfying that the gold net and rya knot ideas were abandoned. Additional variations of the gold leaf grid were also done in response to the first successful attempts.



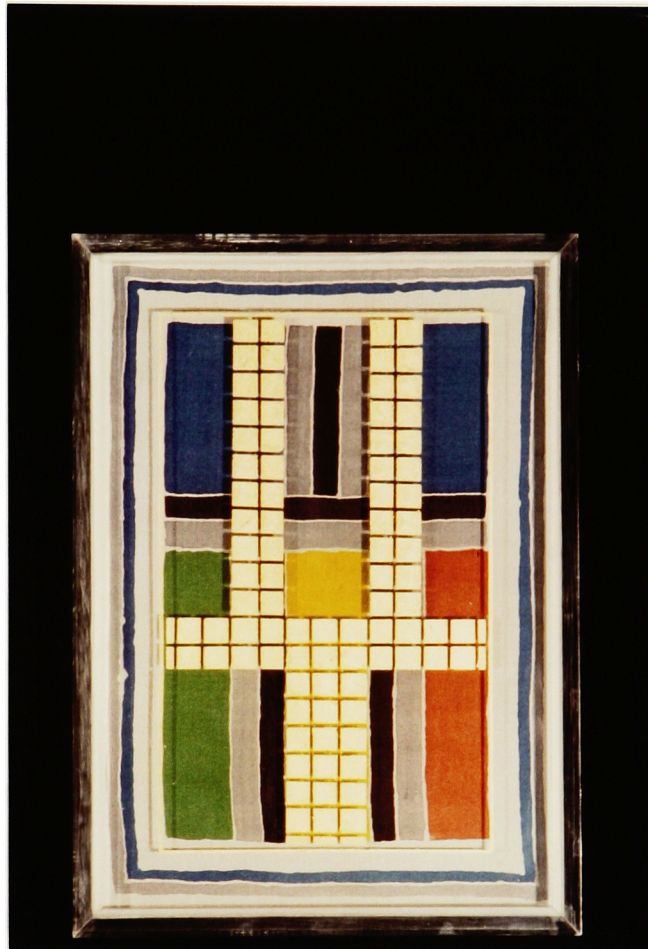
(a)

PLATE 5



(b)

PLATE 5



(c)

PLATE 5

F. The Flapper (Plate 6)

The Flapper was conceived as a two-layered piece, the inner a painted silk and the outer a black net with rya knots tied in black silk. The specific problem I wanted to achieve was to balance large dark or black areas against smaller colored areas, by "contrast by extension" (Ref. 15), as it is formally called.

Initially I started to balance black against the visual primaries: red, blue, yellow, and green, as used in preceding works, but I found that color balance, when large areas of black were used, could not be easily achieved with the primaries. When violet and red-orange were used instead of blue and red, however, the desired balance was achieved. The overlying net also helped to modify the intensity of colors and aids in the color balance. The texture of the rya knots added a rough contrast to the smoothness and sharp edges of the silk below and the clear Plexiglass frames. The Plexiglass frame was selected to support the layers and to allow the color of the background on which it might be hung to blend with the piece. The frames, however, have been judged to be too small and tend to crowd the elements of the design. For this reason, further experimentation with size of frames is needed.

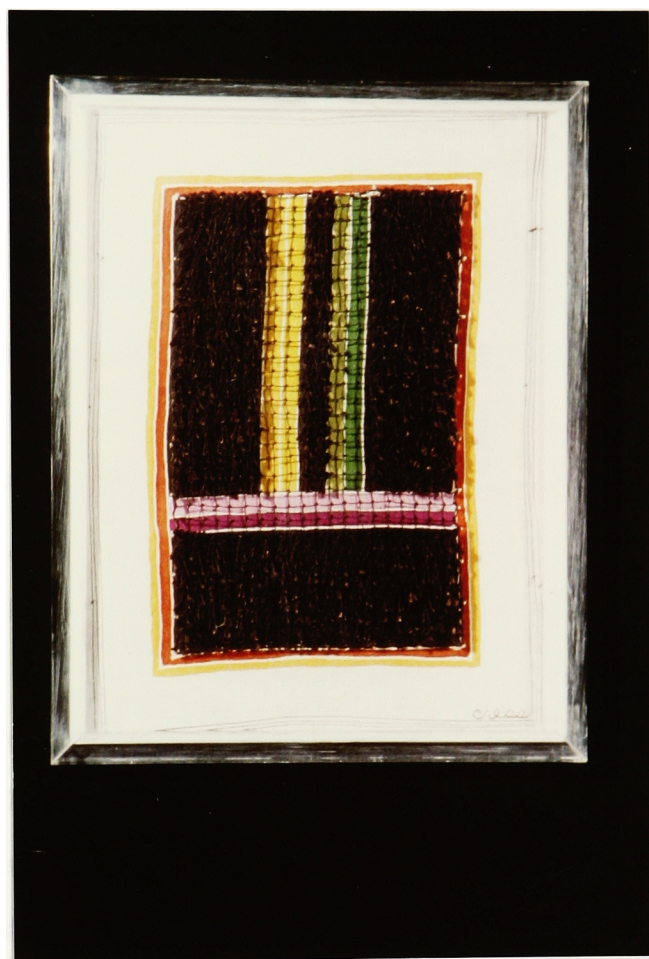


PLATE 6

CONCLUSIONS

My final statements are not conclusions but are merely observations about where I stand in the process of my art expression. I feel a certain detachment with the works in my thesis as each piece functioned primarily as a design problem. It was challenging to design each piece, and excitement intensified during the technical process but peaked at the completion of each piece.

I worked with a number of medias in an attempt to work out my need to express color. At this point I like fiber, but the final media eludes me.

Prior to beginning my thesis I felt very insecure with color balance, and, for this reason, worked almost exclusively with the visible primary colors. I now feel that my color sense has matured and I look forward to experimentation with a broader range of colors.

The grid has provided a simple framework with which to present color, but I now would like to pursue the added dimension of curvilinear shapes produced by stepped rectangular forms.

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